REMARKS

I. STATUS OF THE CLAIMS

Claims 1-24 are original claims. No claims are cancelled or added. Therefore, claims 1-24 are pending.

II. CLAIM REJECTIONS – 35 U.S.C. § 102

The Examiner has rejected claims 1-9, 11, 14-20, 21-22 and 24 under 35 U.S.C. § 102(b) as being anticipated by Carrington et al., (U.S. Patent No. 5,737,456) ("Carrington"). In order to maintain the anticipation rejection, every element of Applicant's claimed invention must be "identically shown" in the Carrington reference. *See In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990) ("For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference."). Applicants respectfully traverse the rejection and provide the following remarks.

A. Claim 1

With respect to claim 1, it appears that the Examiner has misinterpreted the limitation "displacing" as "displaying". Specifically, the Examiner states "As to claim 1, Carrington discloses an imaging method...comprising...displacing (fig 1, element 18, displaying corresponds to video monitor) an imaging device[.]" Action, p. 2. As used in claim 1, the phrase "displacing an imaging device while acquiring an image" relates to moving the imaging device while acquiring an image. Carrington does not disclose displacing the image device while acquiring an image, and therefore does not anticipate claim 1. Specifically, Carrington discloses a method of obtaining multiple images along an axis. For example, the imaging method of Carrington is described as follows:

> Optical sectioning of the image, as would be performed during an actual measurement procedure, is simulated in region **106'** in FIG. **5B**. Here, sections of the image are taken at different planes of focus along the xz plane. In the simulated image, spacing between the section along the z axis is non-periodic: sections are taken at z=0.0, 0.1, 0.2, 0.4, and 0.6. As is clear from the arrows, along the z axis the simulated light distribution from the fluorescing cell extends beyond the measured regions.
>
> The simulated, sampled images along the xy and xz planes shown in regions **106** and **106'** are reconstructed using the image-processing method described in detail above.

Carrington, col. 9, line 57 – col. 10, line 2.

Carrington therefore does not displace the imaging device in one dimension while acquiring an image, but instead moves the imaging device to different points along an axis and takes images at multiple points. For at least these reasons, Carrington does not anticipate claim 1. Accordingly, Applicants request withdrawal of the rejection and timely allowance of claim 1.

B. Claim 2

With respect to claim 2, the Examiner cites separate portions of Carrington as disclosing "varying the focus of an imaging device" and "while acquiring an image of an object." Applicants respectfully submit that the two quotations from the claim are a single limitation that should not be examined separately. The claim limitation "while" explicitly requires that the act of "varying the focus of an imaging device" occurs while "acquiring an image of an object." Therefore, the proper interpretation of the claim is to view the terms as a single limitation: "varying the focus of an imaging device while acquiring an image of an object." Assuming, for the sake of argument, that Carrington discloses "varying the focus of an imaging device" and

separately discloses "acquiring an image of an object", it would not anticipate claim 2 unless the first act occurred while the second act was being performed.

In fact, Carrington does not disclose "varying the focus of an imaging device while acquiring an image of an object." The Examiner cites column 3, lines 10-16 of Carrington as disclosing "varying the focus of an imaging device." Action p. 3 The cited language of Carrington is provided below:

> **The method thus allows generation of high-resolution images, and can be used to identify especially fine features in a sample. Moreover, such images can be generated with a large dynamic range and contain substantially reduced out-of-focus haze. The method can also be used to accurately quantify the degree of optical radiation emanating from a sample.**

Carrington, col. 3, lines 10-16.

In actuality, the cited language does not disclose "varying the focus of an imaging device." Because the cited language does not disclose "varying the focus of an imaging device", it cannot disclose "varying the focus of an imaging device while acquiring an image of an object."

The Examiner also cites column 4, lines 37-62 of Carrington as disclosing "while acquiring an image of an object." Action p. 3. The cited language of Carrington is provided below:

Referring first to FIG. 1, an imaging system **10** featuring an image-measuring device **12** and a signal processing system **14** allows generation of a high-resolution, digital electronic image of a sample **16**. The image can be measured on a very small scale with the image-measuring device **12** and, following processing with the processing system **14**, may be viewed using a video monitor **18**.

The image-measuring device **12** includes an optical imaging system, such as a lens **20** having a focal length f, for collecting an optical image from the sample **16**, and a detector **22** for converting the optical image into a series of electronic signals. The image-measuring device **12** may be, for example, a microscope, confocal microscope, telescope, camera, lens system, or a combination thereof. The detector is preferably a CCD, diode array, digital video camera, or similar device capable of generating a digital electronic image in response to an incident optical field.

Once in a digital form, the image is processed using the processing system **14**. This systems includes a memory unit **24** for storing data prior to and following processing, and a data processor **26** for performing the image-processing steps outlined in detail below. Following reconstruction using the processing system, a high-resolution image of the sample **16** can be viewed on the video monitor, stored in the memory unit **24**, or printed onto a viewable medium.

Carrington, col. 4, lines 37-62.

While this citation from Carrington appears to disclose "acquiring an image", it does not disclose varying the focus of an imaging device <u>while</u> acquiring an image of an object. In fact, Carrington teaches away from such a limitation. For example, Carrington states in another section (cited by the Examiner for support of the rejection of claim 7):

> Determination of the PSF involves first acquiring a series of two-dimensional optical sections **42, 42'** which, for example, may lie in (i.e., section **42**), above, or below (i.e., section **42'**) a plane contained by the bead. As indicated in the figure, the sections are acquired by moving a lens **20** to different positions along the z axis relative to the bead, and then digitally recording the image. In all cases, the lens may be translated using electro-mechanical means known in the art, such as a computer-controlled stepper motor or piezoelectric device.

Carrington, col. 5, lines 3-11 (emphasis added).

Carrington explicitly teaches moving lens 20 to different positions and then recording the image. The reference does not teach moving the lens to different positions while acquiring an image. For at least these reasons, Carrington does not anticipate claim 2. Accordingly, Applicants request withdrawal of the rejection and timely allowance of the claim.

C. Claims 3-9

Claims 3-9 depend from claim 2 and are therefore allowable for at least the reasons provided above. In addition, claims 3-9 may contain additional limitations that are not disclosed by Carrington. For example, claim 3 requires that the representation comprise a two dimensional projection of three dimensions of the object. The Examiner cites the following passage of Carrington as disclosing this limitation:

> Optical imaging systems incorporating CCDs are used in a variety of applications. For example, these systems are used to reconstruct images from fluorescently labeled cells. Here, the features of the image are typically small, and thus it is desirable for the pixels of the detector to be as small as possible. To generate images having high signal-to-noise ratios, such systems often necessitate exposing the sample to high optical fluences or may require use of a very thin sample. Such fluences are undesirable, as they may result in photodamage or photobleaching of the sample. Moreover, standard CCD-based imaging methods require a large number of sections to reconstruct the three-dimensional image, resulting in prohibitively long data-acquisition times.

Carrington, col. 1, lines 28-41.

As shown in the language cited above, Carrington does not disclose that the representation (which has been generated by deconvolving a blurred image, per claim 2) comprises a two dimensional projection of three dimensions of the object. In fact, the reference makes not mention of dimensions at all in this citation. For at least these reasons, Carrington does not anticipate claim 3. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claim.

Claim 5 also requires "varying the focus while a shutter of the imaging device is open." The Examiner cites the following passage of Carrington as support for this limitation:

> Since the images for each plane may be recorded simultaneously for the entire field, information for the three-dimensional image can be acquired in relatively brief intervals (as short as 15 msec.). This minimizes motion-related effects in the image which can lead to blurring.

Carrington, col. 8, lines 45-49.

Nowhere does the cited passage disclose "varying the focus while a shutter of the imaging device is open." Again, the cited portion of the reference makes no mention of varying

the focus, much less doing so while the shutter is open. In addition, the cited passage explicitly mentions the minimization of motion-related effects in the image. Such effects, however, are increased, rather than minimized, when the focus is varied "while a shutter of the imaging device is open". For at least the reasons provided above, Carrington does not anticipate claim 5, and Applicants respectfully request withdrawal of the rejection and timely allowance of the claim.

Claim 7 also requires varying the focus comprising applying signals to a piezoelectric focusing mechanism of the imaging device to generate oscillatory movement of the focusing mechanism. For support of this limitation, the Examiner cites column 3, lines 10-16 and column 4, lines 37-62 (see above) as well as the following citation:

> Determination of the PSF involves first acquiring a series of two-dimensional optical sections **42, 42'** which, for example, may lie in (i.e., section **42**), above, or below (i.e., section **42'**) a plane contained by the bead. As indicated in the figure, the sections are acquired by moving a lens **20** to different positions along the z axis relative to the bead, and then digitally recording the image. In all cases, the lens may be translated using electro-mechanical means known in the art, such as a computer-controlled stepper motor or piezoelectric device.

Carrington, col. 5, lines 3-11.

As shown above, the cited language of Carrington does not disclose varying the focus comprising applying signals to a piezoelectric focusing mechanism of the imaging device to generate oscillatory movement of the focusing mechanism. In fact, the reference does not even mention oscillatory movement of the focusing mechanism. For at least these reasons, Carrington does not anticipate claim 7. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of claim 7.

In addition, claim 8 requires varying the focus comprising launching a velocity-controlled focus change using a stand-based focusing mechanism. For support of this limitation, the Examiner cites the same portions of Carrington that were previously cited against claim 7. As shown in the quoted text above from the citations referenced by the Examiner, Carrington does not disclose launching a velocity-controlled focus change using a stand-based focusing mechanism. In fact, the reference does not mention a velocity-controlled focus change using any type of mechanism. For at least these reasons, Carrington does not anticipate claim 8. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claim.

D. Claims 11, 14-19

Claims 11 and 14-19 depend from claim 10 and are allowable for at least the reasons provided below in the discussion of claim 10. In addition, claim 15 is allowable for at least the reasons provided above in the discussion of claim 5. Therefore, Carrington does not anticipate claims 11 and 14-19. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claims.

E. Claims 20-22

In support of the rejection of claim 20, the Examiner states only: "see the rejection of claim 1 above." Action, p. 4. Applicants initially note that claim 20 comprises additional limitations that are not present in claim 1. Specifically, claim 20 requires a "processor in operative relation with the imaging device and configured to execute machine-readable instructions for deconvolving a resulting blurred image to generate a representation of the object". The Examiner has not cited any portion of Carrington as disclosing such a processor. Assuming, for sake of argument, that Carrington does disclose such a processor, the reference

does not disclose other limitations of claim 20. For example, Carrington does not disclose "an imaging device configured to vary its focus while acquiring an image of an object", for at least the reasons explained above in the discussion of claim 2. Therefore, Carrington does not anticipate claim 20. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claims.

Claims 21 and 22 depend from claim 20 and are therefore allowable for at least the reasons provided above in the discussion of claim 20. In addition, claim 21 is allowable for at least the reasons provided above in the discussion of claim 3. Therefore, Carrington does not anticipate claims 21 and 22. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claims.

F. Claim 24

With respect to claim 24, Carrington does not disclose a "means for allowing an image device to vary its focus while acquiring an image of an object" for at least the reasons provided above in the discussion of claim 2. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claims.

III. CLAIM REJECTIONS – 35 U.S.C. § 103

The Examiner has rejected claims 10, 12-13 and 23 under 35 U.S.C. § 102(b) as being unpatentable over Carrington et al., (U.S. Patent No. 5,737,456) ("Carrington") in view of Subbarao (U.S. Patent No. 5,193,124) ("Subbarao"). Applicants respectfully traverse the rejection.

A. Claim 10

Claim 10 claims an imaging method comprising a series of steps. Step (b) requires "varying the focus of the imaging device while collecting the acquired image, thereby blurring

the image." For support of this limitation, the Examiner cites the same portions of Carrington that were referenced in the rejection of claim 2 (*i.e.* col. 3, lines 10-16; col. 4, lines 37-62; col. 8, lines 28-65). Applicant's discussion of Carrington in Section II is incorporated herein by reference.

For at least the reasons provided in the discussion of claim 2 above, Carrington does not disclose varying the focus of the imaging device while collecting the acquired image. Therefore, Carrington does not disclose step (b) of claim 10. In addition, Carrington does not suggest varying the focus while collecting the acquired image, and in fact, teaches away from such an action. As explained above, Carrington teaches moving a lens and then capturing an image (*see* col. 5, lines 3-11). Furthermore, Carrington teaches the minimization of motion-related effects (*see* col. 8, lines 45-49). Varying the focus of the imaging the while collecting the acquired image would increase, rather than minimize, such effects.

In addition, Subbarao does not teach varying the focus of the imaging device while collecting the acquired image. Subbarao discloses a method and apparatus for determining the distance of a surface patch of an object from a camera system. Subbarao, Abstract.

Claim 10 is therefore different from Carrington and Subbarao for at least the reason that Carrington and Subbarao do not provide for varying the focus of the imaging device while collecting provided above. As a result, the combination of Carrington and Subbarao would not teach the invention claimed in claim 10.

Furthermore, it would not have been obvious to modify either Carrington or Subbarao to vary the focus of the imaging device while collecting the acquired image, thereby blurring the image. As explained above, Carrington teaches away from such a method. For at least these reasons, Carrington and Subbarao do not render obvious the invention claimed in claim 10.

Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claim.

B. Claims 12-13

Because claims 12-13 depend from claim 10, these claims are allowable for at least the reasons provided above with respect to claim 10. In addition, these claims may contain additional limitations that further evidence their patentability. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claims.

C. Claim 23

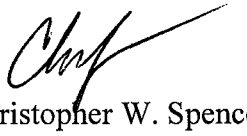
Claim 23 depends from claim 20, and is therefore allowable for at least the reasons provided in the discussion of claim 20 above. Accordingly, Applicants respectfully request withdrawal of the rejection and timely allowance of the claim.

IV. CONCLUSION

Applicant believes that the present document is a full and complete response to the Office Action mailed July 3, 2007. The present case is in condition for allowance and such favorable action is requested.

The Examiner is invited to contact the undersigned Attorney at (512) 536-3072 with any questions, comments or suggestions relating to the referenced patent application

Respectfully submitted,



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